

Reflection: Graphical Journals as a means of increasing research impact

Niall Seery, Technological University of the Shannon

These reflections were born out of several professional discussions that have surfaced through shared practices, perspectives, scholarly teaching, and research endeavours with members of the Technology Education Research Group (www.TERG.ie). The multiple perspectives and experiences that influenced these reflections include engagement with professional design practice, teaching practices, visuo-spatial research, and developments in initial technology teacher education (ITTE). These reflections are not meant to be conclusive, but rather intended to question the status-quo in the pursuit of enhancing the translation of research to practice and by increasing the projection of the voice of practice in the direction and development of research endeavours. The dominance of a single definition of scholarship is challenged in support of a broader recognition of the relevance and potential of graphical journals.

Position and context

This contribution sets out to reflect on the potential of graphical journals as supplementary media to support research and progressive discourse within the disciplinary area of Design and Technology education. The irony of a written reflection to capture the utility of graphical journals is acknowledged and accompanied by a growing awareness that the written approach taken may be a product of conditioned professional assumption, an acquired skill deemed appropriate for this purpose, or an outcome of a hegemony. While this paper can be argued as being ironic as a medium for its objective, it remains an artefact of thought. Exploring thoughts, sharing thinking, facilitating discourse, and furthering insight are not intended to be medium exclusive, yet, written articles are largely the medium that frames the dominant means of disseminating research and thinking in our discipline. The alignment of the message and medium is central to these reflections. It is the disciplinary context that is a critical consideration in the nature of the discourse and the capacity to broaden the audiences that can participate in the discussion.

While a graphical journal is not a new concept, they are peripheral to the dominant means of sharing research evidence and perspectives in technology education. It is difficult to say if this is appropriate or not, or if the current practice could be enhanced. But the speculative driver imagines the world as it would be and wants to question: If there is meaning lost in translation? What is the nature of the meaning that may be beyond the written medium? Is translation to scholarly output accessible to everyone that wants to access contemporary thinking and evidence? Can everyone contribute to the prevailing discourse? What constitutes scholarship in the dissemination of design and technology education research? Could graphical journals develop the disciplinary contributions of research activity?

The purpose of this reflection is not to make a binary argument of 'better' or 'worse', but to consider utility and the augmentation of translating research to practice. Therefore, it may be useful to consider graphical journals as having the potential to add value to the existing model of research practice and reflect on the evolution of how researchers can affect meaningful

translation to practice and be supported in impactful research. To advocate for a broader conception and utility of research communication, specifically as it applies to design and technology education research appears sensible.

The know-how to skilfully produce graphical media that harness the richness, complexity, and power of the visual can have a transformative impact on practice – after all this is the fundamental objective of educational research. This position is not naïve about the significant skill required to master the visual language, but is encouraging ‘mark making’ in all its forms as a medium that can support broader, deeper, and more sustained engagement in evidence-based practice and practice-based evidence.

Graphicacy and Modelling

As the central medium of design and technology practice, visual imagery is encouraged and seen as in-keeping with the ethos of this Journal. Seeing graphics as the language of technology and modelling as the language of design, there is an apparent argument to consider graphic journals as disciplinary appropriate and universally comprehended within design and technology. Graphicacy captures the ability to comprehend, represent and present information in graphical form and broadens the reach to audiences. Reflecting on the IDATER Graphicacy and Modelling conference 2010 (Norman and Seery 2010), it’s now recognised that more should have been done to sustain the importance of these discussions. While significant contributions were made at the time (for example Lane, 2011 and Danos, 2012), the need to develop our thinking, research agendas, and practices associated with the importance of the visual is still (if not even more) relevant.

Many disciplines are now beginning to embrace the graphical format as a means of shifting focus. The emergence of Graphic Medicine (Conference site www.graphicmedicine.org) is a good example of how the medium helped give voice to patients, enabling a narrative account of the complexity of dealing with medical diagnoses and conditions. Graphic Medicine described as the interface between medical humanities and graphics has given voice to the patient, carers and loved ones, that share experiences and challenges, through a medium that can communicate complex and emotive narratives. Graphics as a medium affords the opportunity to personalise, narrate, connect (emotively and empathetically) and be situational and context adaptive. These are affordances that could be very useful when supporting more designerly activity, driven by volition in pursuit of changing the made-world.

Affordances: Suspension of time and space

Inherent in graphical representations are affordances that can support deep and emotive engagement, stimulating a response that is mediated by the individual’s knowledge, experience, and interpretation. While the sensory stimulus can be both static and dynamic they are invariant. Variation comes from the personal assimilation of information and that can be formed instinctively as a result of experience or through explicit meaning making of discipline specific literacy. The comics format is a good example of how to support narrative enquiry through a speculative lens. The affordance of the comics format enables personal, interactive, and reflective engagements that are built through interpretation. Connecting with characters and their experiences enables perspective-taking that shares alternative world views that are often accompanied by clearly communicated emotions. Due to their structure and dominant use of graphics supplemented with text, they can create content that deals with complex

learning and development, particularly in how empathy might be experienced by readers. The structure of the narrative and the communication of complex ideas can efficiently simplify the message by sharing what is being said, what is being thought, where it is happening, and the chronology of actions and consequences. In addition, the power of the format is that all these aspects can also be positioned in an alternative reality, one that may be more speculative, moves between past, present, and future thinking and can manage the 'what if' questions meaningfully. Our capacity to use symbolism is critical to sharing meaning and modelling details that can often be difficult in other forms. The graphical medium in comics form is effective in engaging readers from a range of backgrounds and literacy levels, making the dissemination of information more accessible and engaging.

Scholarship: Sharing artefacts of thought

Information processing theory positions the visual and verbal channels as the means by which information is processed. The combination of both is critical to support meaning-making and it is this relationship that is supported in this reflection. The inherent affordance of these channels forms an interesting perspective depending on the epistemological position taken in relation to design and technology as a discipline area. Where technical information is the primary focus, the sequential nature of verbal information is satisfactory in narrating the order of logic and the graphical media support the technical depictions in an efficient and effective medium. While understanding technology education as 'volition' the synchronous nature of the visual affords a more interpretative, flexible, and speculative input, relaxing constraints not usually afforded through sequential narration. There are excellent examples of how the graphical medium can provide a more experiential engagement and can deal with sophisticated ideas and thinking. One obvious example is 'unflattening' by Nick Sousanis (2015), which originated as an academic output and later published book. This work clearly depicts the capacity to share complex narrative in an efficient, effective, and engaging way. He examines the spectrum of graphicacy, images, and their relationship to understanding and demonstrating how text and images are dependent upon each other and are equal partners in meaning-making. This work goes a long way in defining the scholarship of graphic media as a comparable academic output.

Subject matter

In recent years much emphasis has been placed on the nature and treatment of technological education. The associated research focus has largely reflected the epistemological challenges and the theories surrounding practice and observing practice itself. The transition (or maybe more accurately the evolution) from technical education to technological education brings with it many philosophical debates about what is technology education, debates that are pertinent to the intentions of practice. Despite the variations in epistemological perspectives as they emerge in different treatments of technology education, they are unified by the centrality of designing and making. Models of capability and concepts of the goals of capability are important contributions to shape policy, but also reach practice. Conceptions of the goals (Doyle, 2020) of the subjects bring with it a vectored discussion that shape an applied understanding, where designing and making are central. With this 'constructionist' approach to learning, the physical output/artefact forms the basis of the modelled-thinking. The iterations use graphics to aid in the thinking associated with their meaning-making as applied to context, application case, agenda, and implications. Helping to navigate the territory of designerly activity and the appropriate use and application of new and future technologies requires the

capacity to view alternative worlds, personalise, narrate decisions, connect (emotively and empathetically) and adapt situations and context.

Interestingly both as a natural language and the genesis of communications amongst non-kin, the visual language transcends many of the barriers that exist with the written or spoken word. The mechanics of encoding depth, scale, danger, motion, etc are evolutionary capacities that require no codification. The influence these capacities have on the efficiency with which the message is understood is often unparalleled by alternative mediums. As far back as the seminar works of the Orange Series, the importance of graphicacy and modelling has been well supported. Acknowledging the descriptive power of graphics to capture and communicate embedded information that is not possible to capture by the written word is well argued and supported. The communication of scale, proportionality, relationships, motion, etc. can be presented through efficient representations without ambiguity. While more technical information may require a form of literacy to fully comprehend, there is an inherent effectiveness and efficiency in the use of the image. Moving beyond the apparent technology representation is when the idea of graphical journals become even more relevant. This is evident when considering the imagined image where mental models enable manipulations, treatments, and explorations of speculative acts and possibilities that require representation of future states and possibilities. This shift from a historic technical treatment to a more designerly volition requires increased emotive and empathetic understandings and a shift towards *becoming Ethnotechnologically Literate* (Dakers, 2022) - a more complete view of the nature of activity that considers the implications of technological decisions, practices, and outcomes.

In the context of the design and make activity, capturing the narrative of the journey is not as predetermined or prescribed as some perspectives would imply. Assessment calls for very specific evidence, where criteria is set to ensure a fair and standardised approach to evidence of student performance. While this is important and even essential, it may not reflect fully the nature of the activity, the decision making that is pertinent to the creative expression or the critical knowledge applied to the selection of materials, processes, and functions of the artefact that are the subject of speculative and critical thought. While this activity is complex in first principles, it is the rationale and agency that stimulates this activity and the volition of the creator to make change to made world. This voice is often not well supported in the narrative of research dissemination and yet is critical to defining a technological education, driven by designerly actions.

The role of design and its treatment have attracted much attention in technology education, with much focus on untangling the epistemological basis of both design and technology. This complexity is often shrouded in the language of philosophy and while important, worthy, and impactful, possibility makes it less accessible to practice. This is not to say a graphical journal can or will simplify the concept or sophistication of the thinking, but instead support the message in a way that can be interpreted with relativity and associated practice as being central.

For example, Figure 1 is an artefact of thinking about the lens that shapes the intention of learning activities. This image is not intended to be indicative of how graphical journal content would be developed, structured, narrated or depicted, but instead represent the capacity to

engage (as a starting point) with seminal works in technology education in a different graphical way. Mitcham's Typology of Technology frames the philosophy of technology education as object, activity, knowledge, and volition.

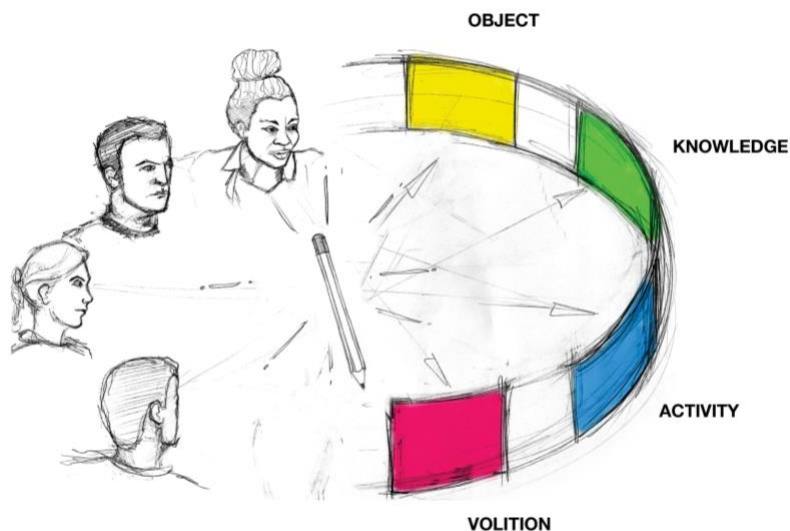


Figure 1. Mitcham's typology of technology (Sketch courtesy of D. Campbell)

This is not an attempt to simplify the complexity of the philosophical positions, but to demonstrate the capacity of such a medium to share the conceptual thinking that is critical to clarify the intentionality essential for effective teaching, learning and assessment and to increase the likelihood of these complex positions being transferred to practice.

Accessibility, digestibility, utility, and meaning

The idea of academic or research impact has been a topical discussion for over the past decade, with much focus on understanding the nature of impact, how activities lead to impact, the associated value of research and the qualification of what is impactful within and beyond academia. Consideration for what is impactful and what can be impacted are central to measures of attribution and metrics that have implications for priorities being set and resources being utilised. Design and Technology Education research has a sustained position over recent years and there is evidence that the discipline has had much impact on practice. Therefore, it is not to say that there is something broken, more a perspective that we could align activities to have a greater impact, particularly by embracing more fully the natural language of the discipline.

The primary aim of design and technology education research is to positively impact practice, a position that is central to the very origin and mission of this journal. Facing practice and having utility in practice can be a challenge, from the perspective of higher education, where the nature of output and the associated measure of performance indicators have historically been defined by bibliometrics. With the origins in library services as a resource planning instrument, bibliometrics can be limited in fully representing the impact of research output and more importantly reward a type of output that may not be relevant or appropriate to the fundamental mission. Where outputs do not reach the practice sphere, the idea of impact is challenged in first principles. There is a growing recognition that impact as a concept is shifting towards a broader conception of how to be impactful. Increasingly institutions are embracing

the altmetric concept and methodology, increasing awareness, collaboration, and the potential reach beyond that of traditional research outputs. While it is not the intention of this reflection to engage with the open access debate as it is not applicable to this journal, it is a debate that illustrates the support for making research more accessible.

There is an onus on the research community to at least explore ways of increasing the accessibility of research evidence and thinking. While production of a Graphic Journal should not be seen as a *'post process'* after the article is written, this approach could also be a useful exercise as an impactful output. Schools are busy environments, with increasingly complex contexts and challenges and many demands on the teaching profession. Engaging with research can be a time-consuming activity, one that often requires a significant lead time. Graphical Journals could serve as a useful medium to engage with research evidence in a more tangible way and reduce the dissonance that often exists in translating research to practice.

Research engagement is a central tenant in teacher professional development in Ireland. The National Teaching Council promotes and regulates the standards of the teaching profession and promotes a culture of research, shared learning, and evidence-informed practice through its Croí initiative (Collaboration and Research for Ongoing Innovation). To think that academic output in the format of a graphical journal could be supported by an international journal is useful in disseminating material that has direct relevance in practice. Furthermore, there is no reason why Graphical Journals are not seen as comparable to traditional university metrics, maybe even with the added advantaged of altmetric indicators.

The driver from much of the work of TERG research activity is its use-inspired nature. While the ideologies of teacher can differ from the teacher's need to seek out relevance and external validity, researchers tend to operate in a space where rigor and internal validity are the primary concern (Smith et. al. 2013). While these appears to be opposing, it is critical that they both reflect the use-inspired basic research agenda, where bi-directional dialogue becomes the norm.

Concluding comments

It would be a positive move for the discipline if everyone could engage in the seminal works, ideas, and thinking that relate to the subjects of design and technology. Considering what a graphical journal can contribute in this regard, there are two primary perspectives. One is the potential to transpose examples that link to existing articles to rearticulate the key messages, with the objective of increasing the reach of the research, ideally engaging practicing teachers. Secondly, original work that can be utilised in a different way. For example, imagine a graphical journal that can be deconstructed and displayed, becoming omnipresent in the environs of practice. If Figure 1 above was a poster in a technology room, what impact would it have on the intentional planning of teaching and assessment practices? Would practices be consciously derived from Mitcham's (1985) typology of treatments and as a result increase the constructive alignment of teaching, learning, and assessment? Extrapolating the same principle, could the ubiquitous nature of social media and the various similar channels that support limited 'space' for the publishing of a message utilise key depictions of central ideas in design and technology, maximising the affordance of graphical journals.

It is one thing to reflect on the potential that graphical journals may offer design and technology, it is another thing to create graphical artefacts that are thought provoking, useful, and can have impact. This is the challenge that members of TERG have embraced and will attempt to produce works, not as standard setting exercises but rather as the start of a conversation to establish feasibility, viability, and utility. If useful, these conversations may be a kickstart to develop, broaden, and champion a more mainstream advocacy and recognition of this evolving concept of scholarship.

References

- Dakers, J. R. (2022). *A Nomadic Pedagogy About Technology: Teaching the Ongoing Process of Becoming Ethnotechnologically Literate* (International Technology Education Studies, Vol. 18). Brill Academic Pub. ISBN: 978-90-04-53699-9
- Danos, X., (2012). *Graphicacy and Culture: Refocusing on Visual Learning* Loughborough Design Press. Loughborough ISBN 978-1-909671-06-5
- Doyle, A. (2020). Consolidating concepts of technology education: From rhetoric towards a potential reality. KTH Royal Institute of Technology, Stockholm. Doctoral dissertation.
- Lane, D., (2011) Developing Sketching Expertise within Technology Education. University of Limerick, Limerick. PhD Thesis
- Mitcham, C., (1994), *Thinking Through Technology: The Path between Engineering and Philosophy*, University of Chicago Press, Chicago.
- Norman, E., and Seery, N., Eds (2010) IDATER Online conference: Graphicacy & Modelling. ISBN 978-1-907382-51-2
- Sousanis, N., (2015) *Unflattening*. Harvard University Press. Cambridge. ISBN 9780674744431